

What is Claimed:

1 1. A method for deployment of a multi-part endoluminal device in a distal
2 location in a body lumen from a proximal location, the device having at least a first portion
3 and a second portion, each portion having a distal end and a proximal end, the method
4 comprising the steps of:

5 (a) deploying the first portion in a body lumen by aligning the first portion
6 distal end in a desired location and then deploying a remainder of the first portion including
7 the first portion proximal end; and

8 (b) deploying the second portion in the body lumen by aligning and
9 anchoring the second portion proximal end in a desired location and then deploying a
10 remainder of the second portion including the second portion distal end in overlapping
11 engagement with the first portion proximal end.

1 2. The method of claim 1, wherein step (a) comprises deploying the first
2 portion sequentially from the distal end to the proximal end and step (b) comprises deploying
3 the second portion sequentially from the proximal end to the distal end.

1 3. The method of claim 1, wherein the first portion comprises a modular
2 bifurcated device having a main body portion with a distal end, a first stump, and a second
3 stump, each stump having a proximal end, and the second portion comprises at least one leg
4 portion adapted to interface with the first stump, wherein step (a) comprises deploying the
5 bifurcated device in a body lumen by aligning the distal end of the main body portion in a
6 desired location and deploying the remainder of the first portion sequentially from the distal
7 end to the first stump proximal end and second stump proximal end, and step (b) comprises
8 deploying the leg portion with the leg portion distal end in overlapping engagement with the
9 first stump proximal end.

1 4. The method of claim 3, wherein the bifurcated device is adapted to be
2 deployed in an aorta and the leg portion is adapted to be deployed in an iliac artery.

1 5. The method of claim 4, wherein the desired location for the leg portion
2 proximal end is distal of an internal iliac artery.

1 6. The method of claim 3, wherein the device further comprises a second
2 leg portion having a distal end and a proximal end, the steps further comprising:

3 (c) deploying the second leg portion in the body lumen by aligning and
4 anchoring the second leg portion proximal end in a desired location and then deploying a
5 remainder of the second leg portion including the second leg portion distal end in
6 overlapping engagement with the second stump proximal end.

1 7. The method of claim 6, wherein the bifurcated device is adapted to be
2 deployed in an aorta and the two leg portions are each adapted to be deployed in an iliac
3 artery.

1 8. The method of claim 6, wherein step (a) comprises deploying the main
2 body portion sequentially from the distal end to the proximal ends of the stumps and steps (b)
3 and (c) comprise deploying each of the first and second leg portions sequentially from the
4 proximal end to the distal end.

1 9. The method of claim 6, wherein the steps (a) and (b) are performed
2 from a first proximal access location and step (c) is performed from a second proximal
3 access location.

1 10. The method of claim 3, wherein the device further comprises a second
2 leg portion having a distal end and a proximal end and a leg connector portion having a
3 proximal end and a distal end and adapted to interface with the second stump and the second
4 leg portion, the method further comprising the steps of:

5 (c) deploying the leg connector portion by aligning the leg connector distal
6 end with the second stump proximal end and then deploying a remainder of the leg connector
7 including the leg connector proximal end; and

8 (d) deploying the second leg portion in the body lumen by aligning and
9 anchoring the second leg portion proximal end in a desired location and then deploying a
10 remainder of the second leg portion including the second leg portion distal end in
11 overlapping engagement with the leg connector proximal end.

1 11. The method of claim 10, wherein the steps (a) and (b) are performed
2 from a first proximal access location and steps (c) and (d) are performed from a second
3 proximal access location.

1 12. The method of claim 10, wherein steps (a) and (c) comprise deploying
2 each of the main body portion and the leg connector sequentially from its respective distal
3 ends to its respective proximal end or ends and steps (b) and (d) comprise deploying each of
4 the first and second leg portions sequentially from its respective proximal end to its
5 respective distal end.

1 13. A method for deployment of a multi-part endoluminal device in a distal
2 location in a body lumen from a proximal location, the device comprising a modular
3 bifurcated device comprising a main body portion, two leg portions, and at least one leg
4 connector portion, the main body portion having a distal end and two stump portions, each
5 stump portion having a proximal end, the leg connector portion having a proximal end and a
6 distal end, the leg connector portion adapted to interface with one of the two stump portions
7 and one of the two leg portions, the method comprising the steps of:

8 (a) deploying the main body portion by first aligning and anchoring the
9 main body portion distal end in a desired location in the body lumen, and then deploying a
10 remainder of the main body portion including the two stump portion proximal ends;

11 (b) deploying the leg connector portion by first aligning and anchoring the
12 leg connector portion distal end in one of the two stump portion proximal ends, and then
13 deploying a remainder of the leg connector portion in the body lumen including the leg
14 connector portion proximal end; and

15 (c) deploying a first of the leg portions by first aligning and anchoring the
16 proximal end of the first leg portion in a desired location in the body lumen and then
17 deploying a remainder of the first leg portion such that the leg portion distal end is in
18 overlapping engagement with the leg connector portion proximal end.

1 14. The method of claim 1, wherein step (c) comprises

2 (c1) inserting an introducer into the body lumen, the introducer comprising
3 a retrograde portion; an antegrade portion; a shaft having a distal tip; an inner sheath

4 mounted concentrically over the shaft with the endoluminal device mounted concentrically
5 over the inner sheath; and an anterograde sheath proximally attached to the shaft distal tip,
6 mounted over the endoluminal device in the anterograde portion of the introducer, and
7 axially moveable relative to the inner sheath;

8 (c2) aligning the introducer in a deployment location;

9 (c3) extending the shaft to distally advance the anterograde sheath to deploy
10 at least a distal portion of the endoluminal device; and

11 (c4) removing the introducer from the body lumen.

1 15. The method of claim 14, wherein the introducer further comprises
2 anchoring means in the anterograde portion for anchoring the endoluminal device during
3 deployment of the device from a proximal end to a distal end of the device, the method
4 comprising aligning the proximal end of the device with the deployment location in step (c2)
5 and confining the endoluminal device between the anchoring means and the advancing
6 anterograde sheath in step (c3).

1 16. The method of claim 14, wherein the introducer further comprises
2 anchoring means for anchoring a proximal portion of the endoluminal device during
3 deployment of the device from a proximal end to a distal end of the device, the method
4 comprising aligning the proximal end of the device with the deployment location in step (c2),
5 anchoring the proximal end prior to or during step (c3), and releasing the proximal end prior
6 to or concurrently with step (c4).

1 17. The method of claim 16, wherein the anchoring means comprises an
2 inflatable balloon and the anterograde sheath extends proximally over the balloon, in which
3 the method further comprises in step (c3) partially advancing the anterograde sheath to
4 expose the balloon, inflating the balloon, completing advancement of the anterograde sheath,
5 and then deflating the balloon.

1 18. The method of claim 16, wherein the anchoring means comprises an
2 inflatable balloon, and the method further comprises inflating the balloon prior to step (c3)
3 and deflating the balloon after step (c3).

1 19. The method of claim 18, wherein the introducer further comprises a
2 proximally retractable retrograde sheath mounted concentrically over the shaft and inner
3 sheath and extending axially over the proximal end of the endoluminal device and the
4 balloon, the method further comprising retracting the retrograde sheath prior to inflating the
5 balloon, and inflating the balloon to anchor the proximal end of the endoluminal device
6 against the body lumen.

1 20. The method of claim 18, wherein the introducer further comprises a
2 proximally retractable retrograde sheath mounted concentrically over the shaft and inner
3 sheath and extending axially over the proximal end of the endoluminal device and the
4 balloon, the method further comprising inflating the balloon to anchor the proximal end of
5 the endoluminal device against the retrograde sheath and then retracting the retrograde sheath
6 after deflating the balloon.

1 21. A system for deploying an endoluminal device, the system comprising:

2 a first introducer loaded with a first endoluminal device having a distal end
3 and a proximal end, the first introducer adapted to deploy the device sequentially from the
4 distal end to the proximal end;

5 a second introducer loaded with a second endoluminal device having a
6 proximal end and a distal end adapted to engage the first endoluminal device proximal end,
7 the second introducer adapted to anchor the proximal end of the second endoluminal device
8 while deploying the second endoluminal device sequentially from the proximal end to the
9 distal end.

1 22. The system of claim 21, wherein the second endoluminal device distal
2 end is adapted to be deployed radially within the first endoluminal device proximal end.

1 23. The system of claim 22, wherein the second endoluminal device distal
2 end is adapted to laterally overlap the first endoluminal device proximal end along a length of
3 at least about 2 centimeters.

1 24. The system of claim 21, wherein the first endoluminal device
2 comprises a bifurcated device having a main body portion with a distal end, and two stumps,

3 each stump having a proximal end, and the second endoluminal device comprises a first leg
4 portion adapted to interface with the first stump.

1 25. The system of claim 21, wherein the first endoluminal device
2 comprises a bifurcated device having a main body portion with a distal end, a first stump
3 with a proximal end, and a second stump with a proximal end, in which the second
4 endoluminal device comprises a first leg portion adapted to interface with the first stump, and
5 the system further comprises a third introducer loaded with a second leg portion having a
6 proximal end and a distal end adapted to engage the second stump proximal end, the third
7 introducer adapted to anchor the proximal end of the second leg portion while deploying the
8 second leg portion sequentially from the proximal end to the distal end.

1 26. The system of claim 21 further comprising
2
3 a third introducer loaded with a bifurcated endoluminal device having a main
4 body portion with a distal end, a first stump with a proximal end, and a second stump with a
5 proximal end, the third introducer adapted to deploy the main body portion sequentially from
6 the distal end to the first and second stump proximal ends;
7
8 wherein the first endoluminal device is a leg connector adapted to interface with the first
stump proximal end, and the second endoluminal device comprises a first leg portion adapted
to interface with the leg connector.

1 27. The system of claim 26 further comprising:
2
3 a fourth introducer loaded with a second leg portion having a proximal end
4 and a distal end adapted to engage the second stump proximal end, the fourth introducer
5 adapted to anchor the proximal end of the second leg portion while deploying the second leg
portion sequentially from the proximal end to the distal end.

1 28. The system of claim 21, wherein the second introducer comprises:
2
3 a shaft having a distal tip;
4
5 an inner sheath mounted concentrically over the shaft;
6
7 the endoluminal device mounted concentrically over the inner sheath, and

5 an anterograde sheath attached distally to the distal tip, mounted over the
6 endoluminal device in the anterograde portion of the introducer, and distally moveable
7 relative to the inner sheath by moving the shaft.

1 29. The system of claim 25, wherein the second introducer and the third
2 introducer each comprise:

3 a shaft having a distal tip;

4 an inner sheath mounted concentrically over the shaft;

5 the endoluminal device mounted concentrically over the inner sheath, and

6 an anterograde sheath attached distally to the distal tip, mounted over the
7 endoluminal device in the anterograde portion of the introducer, and distally moveable
8 relative to the inner sheath by moving the shaft.

1 30. The system of claim 27, wherein the second introducer and the fourth
2 introducer each comprise:

3 a shaft having a distal tip;

4 an inner sheath mounted concentrically over the shaft;

5 the endoluminal device mounted concentrically over the inner sheath, and

6 an anterograde sheath attached distally to the distal tip, mounted over the
7 endoluminal device in the anterograde portion of the introducer, and distally moveable
8 relative to the inner sheath by moving the shaft.